Wisconsin State Patrol Predictive Analytics

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Program Objectives

▸ Optimize staffing allocation

▸ Increase law enforcement visibility in the right locations at the right times to maximize impact on traffic safety

▸ Enhance incident management capability by reducing response time

▸ Safer roadways

Forecasting Models

▸ CRASH – Predict likelihood of serious injury and fatal crashes

▸ OWI – Predict likelihood of alcohol-involved incidents

▸ Incident Management – Predict likelihood of intermediate or major incidents
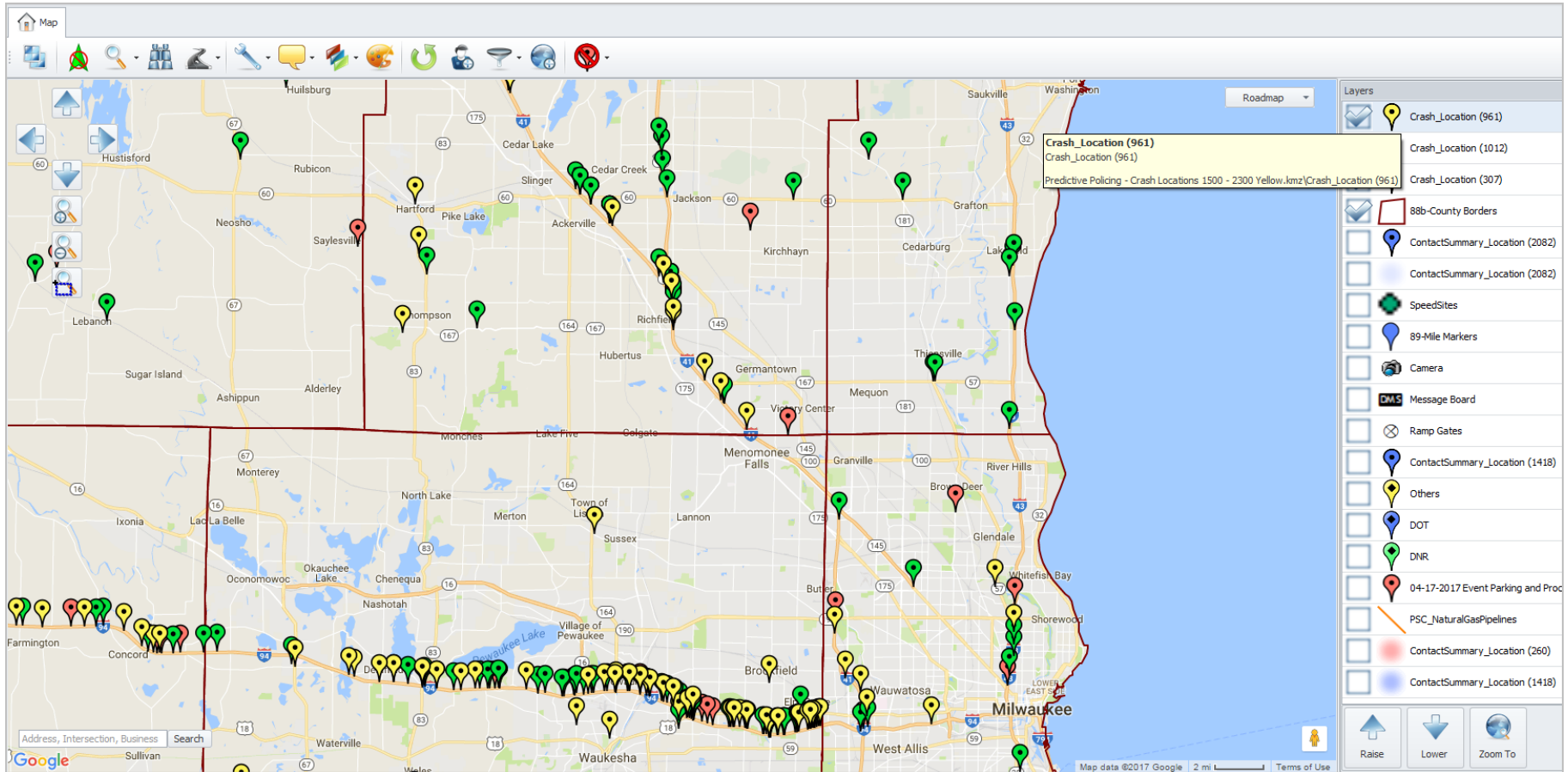
▸ CMV – Predict likelihood of commercial vehicle crashes
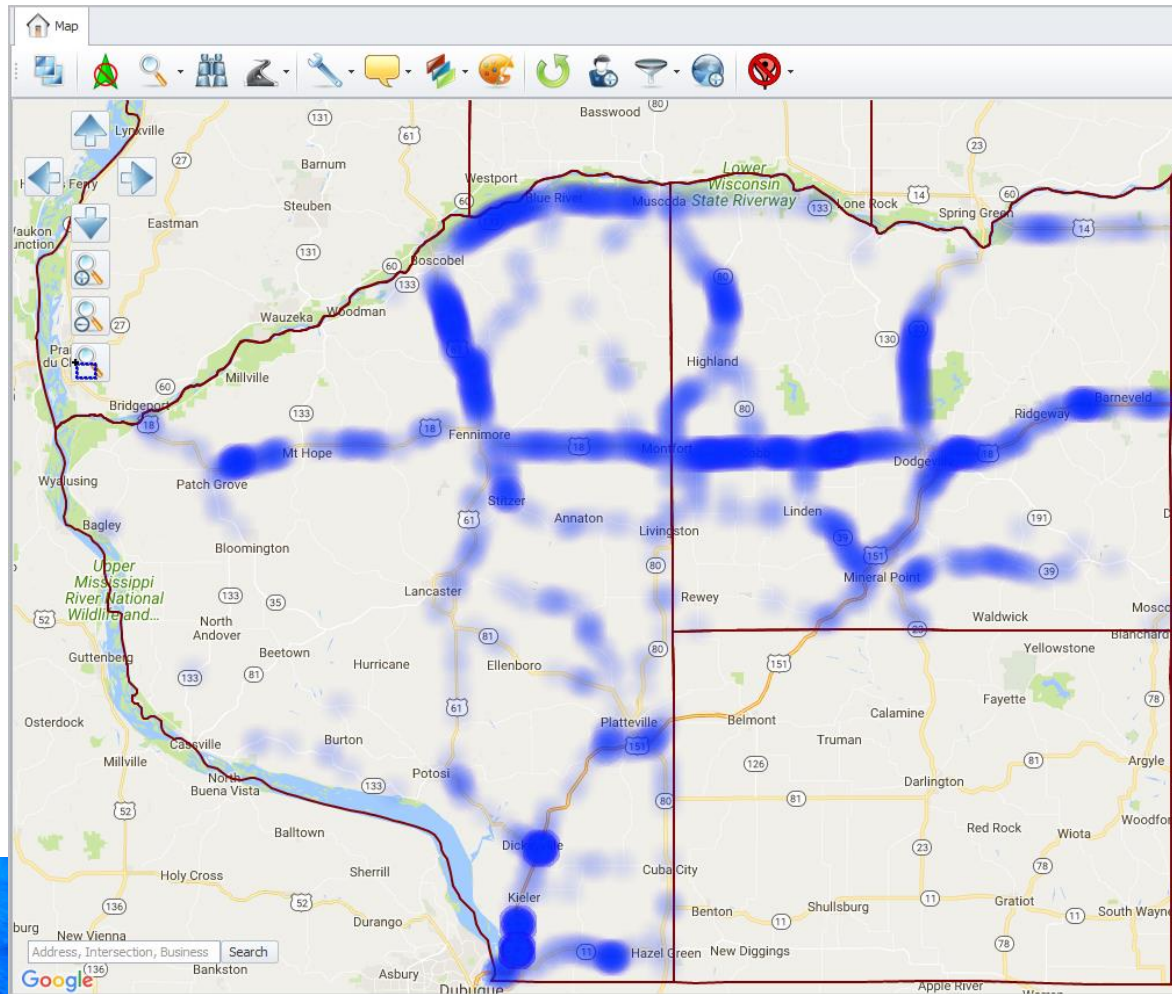
Predictive Model Overview

▸ Identifies areas of concern by time of day, day of week and geographic location

▸ Data is presented as a heat map, pin map and table
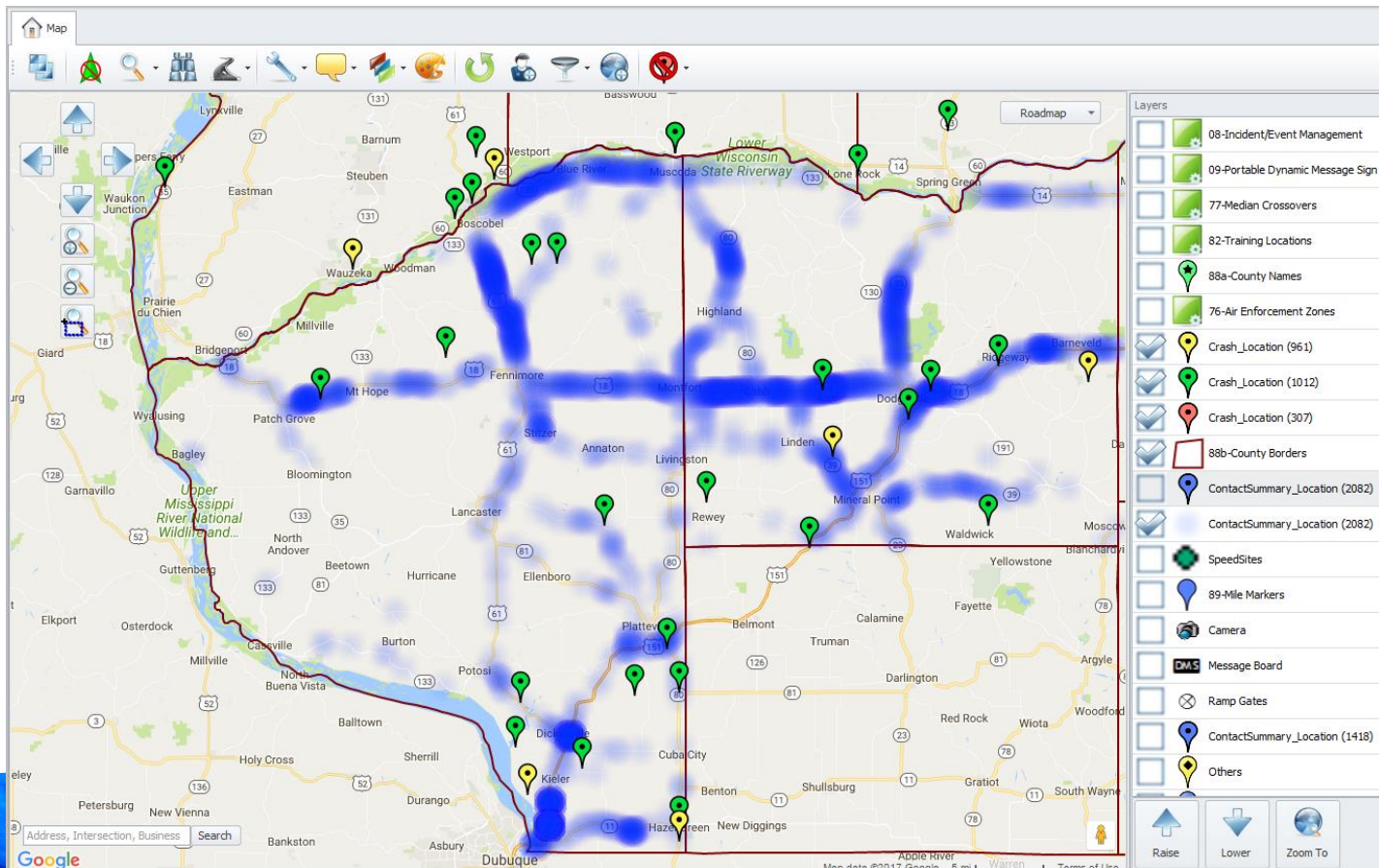
▸ Staffing is allocated accordingly

Pin Map (Traffic Crashes by Shift)
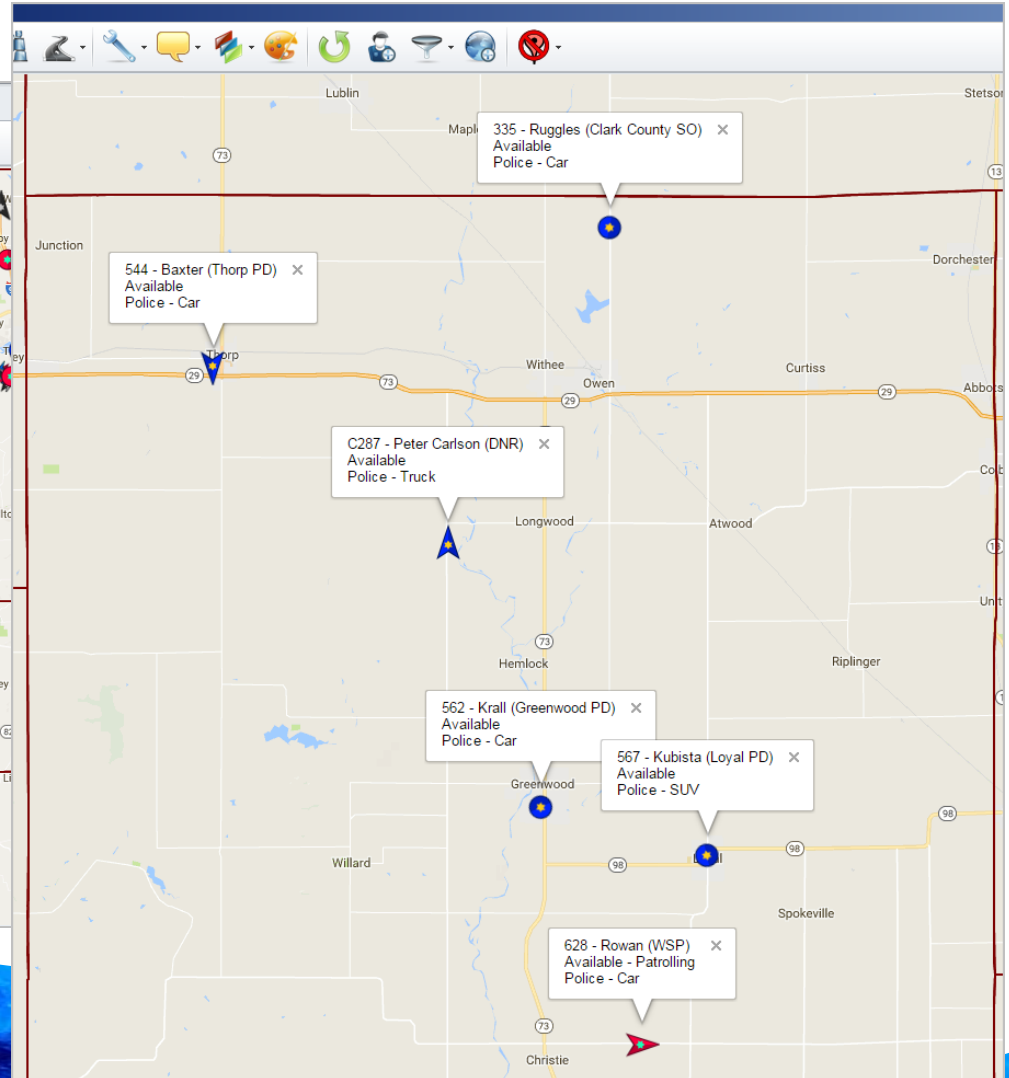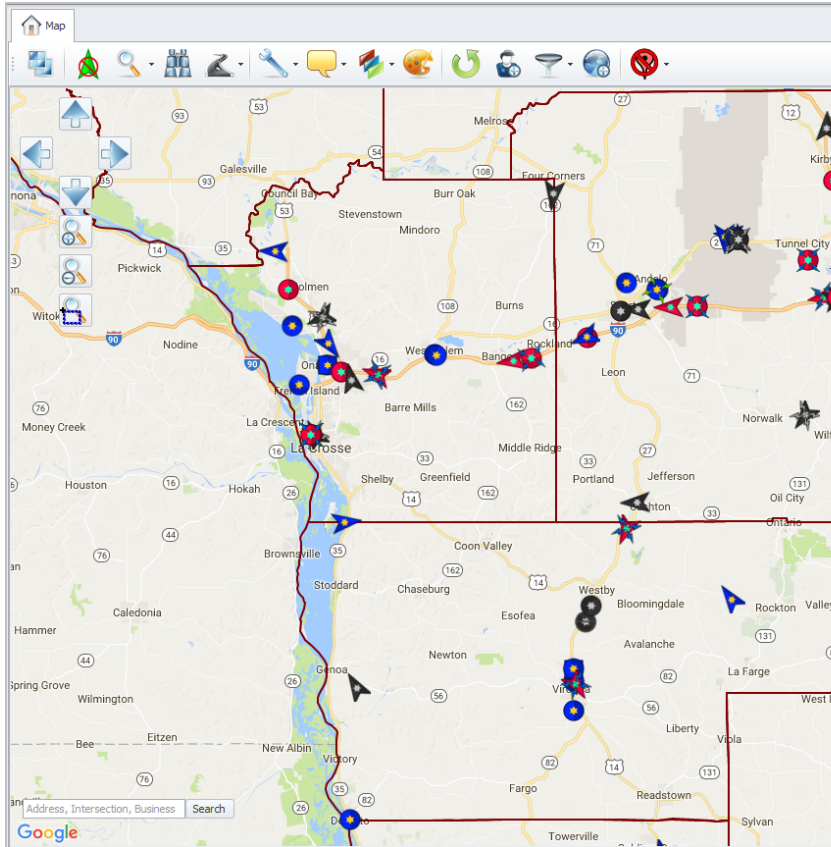
Heat Map (Traffic Stop Locations)

Combination Crash Location and Traffic Stop Location Mapping

Real Time Tracking of Deployed Resources

Combine Predictive Analytics with Mapped Data to Develop Mitigation Strategies

Heat Map

IH 39/90 **Segment 1**

Madison to Illinois State line

Hour	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Thursday 9/1	338	326	267	303	480	1059	2022	2545	1879	1655	1765	1928	1854	1977	1962	1942	2105	2042	1662	1466	1131
Friday 9/2	406	318	345	318	490	1024	1983	2460	2116	2153	2345	2561	2534	2546	2320	1795	3044	2746	2150	2946	2958
Saturday 9/3	555	384	317	298	350	575	934	1569	2286	2573	3091	3066	3025	2773	2600	2203	1821	1770	1393	1052	933
Sunday 9/4	287	227	154	146	134	183	346	567	1101	1662	2240	2231	2202	2010	1857	1799	1619	1552	1222	1123	940
Monday 9/5	267	233	135	108	158	215	324	553	816	1247	1670	1822	2032	2051	1887	1736	1668	1613	1419	1196	1008

Heat Map – Law Enforcement

IH 39/90   Segment 1

- **Madison to Illinois State line**

Day	NB Start PDR	NB Stop PDR		SB Start PDR	SB Stop PDR
Thursday	5:00 AM	MIDNIGHT		6:00 AM	11:00 PM
Friday	5:00 AM	MIDNIGHT		6:00 AM	11:00 PM
Saturday	6:00 AM	10:00 PM		7:00 AM	11:00 PM
Sunday	8:00 AM	11:00 PM		8:00 AM	11:00 PM
Labor Day	8:00 AM	11:00 PM		7:00 AM	11:00 PM

Heat Map – Alcohol/Speed
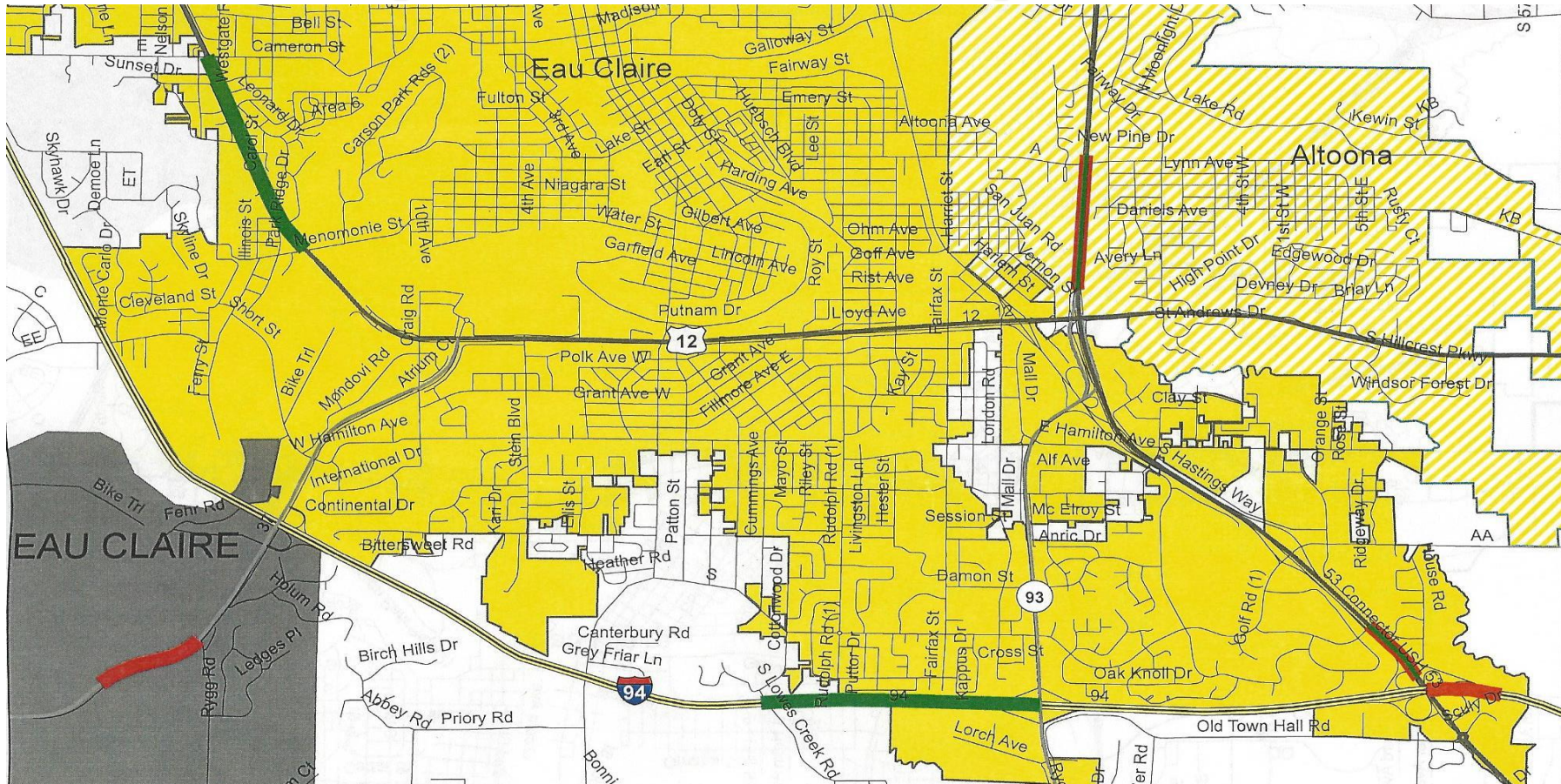
Next steps

- Fully develop predictive models for all crash types
- Utilize predictive models to enhance incident management capabilities
- Allocate staff during times and in locations they can be most effective
- Utilize predictive models to better target areas for engineering studies

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